



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/734,816

12/12/2003

Steven A. Soper

Soper 0023.1

3513

25547

7590

07/06/2011

PATENT DEPARTMENT

TAYLOR, PORTER, BROOKS & PHILLIPS, LLP

P.O. BOX 2471

BATON ROUGE, LA 70821-2471

EXAMINER

LEE, SIN J

ART UNIT

PAPER NUMBER

1722

MAIL DATE

DELIVERY MODE

07/06/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/734,816

Applicant(s)

SOPER ET AL.

Examiner

SIN LEE

Art Unit

1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-10,12 and 14 is/are rejected.
- 7) ☒ Claim(s) 3,5,11,13,15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ ~~Copies of the certified copies of the priority documents have been received in this National Stage~~
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Due to applicants' request for a telephonic interview, the Examiner made an attempt at such interview by calling Mr. John H. Runnels (attorney for applicants) on July 1, 2011. However, Mr. Runnels was not available at the time for the interview.
2. In view of the amendment, previous 112, first paragraph rejection and 112, second paragraph rejection on claims 1-16 are hereby withdrawn.

Claim Rejections - 35 USC § 112

3. Claim 12 is rejected under 35 U.S.C. 112, 4th paragraph, as being of improper dependent form for failing to further limit the subject matter of the claim upon which it depends, or for failing to include all the limitations of the claim upon which it depends. In claim 12, applicants recite that the one or more reactants comprises a polymer initiator or a monomer, and said process additionally comprises the step of forming a second polymer bound to the first polymer in situ by reaction of monomer with the bound initiator or bound monomer. However, since present claim 1 does not include a *polymer initiator* or a *monomer* among the lists of the one or more reactants, present claim 12 fails to further limit the subject matter of claim 1. Applicant may cancel the claim(s), amend the claim(s) to place the claim(s) in proper dependent form, rewrite the claim(s) in independent form, or present a sufficient showing that the dependent claim(s) complies with the statutory requirements.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. The Examiner agrees with applicants' argument that calcium carbonate is not piezoelectric (as asserted by the Examiner in the last Office action). However, the 102(e) rejection over Nakagawa (US 2003/0143411 A1) still stands as explained below.
6. Claims 1, 2, 4, 6-10 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakagawa (US 2003/0143411 A1) (with Kawahara et al (US 7,965,438 B2) which is being cited here merely to support the Examiner's assertion that calcium carbonate is a metal oxide; Furuzono et al (US 7,749,429 B2) which is being cited here merely to support the Examiner's assertion that calcium carbonate is a ceramic; and Norris (3,658,672) which is being cited here merely to support the Examiner's assertion that calcium as in calcium carbonate is an oxidized metal).

In claim 1 and [0088] (see also Fig.1A-1D and Fig.2E-2F), Nakagawa teaches the following;

1. A process for forming a surface-conductive resin,
comprising steps of:

selectively generating reactive groups, which is capable
of substitution under alkaline conditions, on a resin
surface;

bringing the reactive groups into contact with an alkaline
solution so as to substitute parts of the reactive groups
by alkali metal ions;

bringing the substituted parts by the alkali metal ions into
contact with an ion solution of a conductive material so
as to substitute the alkali metal ions by ions of the
conductive material; and

reducing the ions of the conductive material so as to
deposit the conductive material on the resin surface.

As preferable reactive groups selectively generated, Nakagawa teaches the carboxyl (COOH) group (see [0051]). The reactive groups can be selectively generated in the form of a pattern by light exposure through a pattern mask (see [0035]). As the resin, Nakagawa teaches that polyimide is preferred (see [0043] and [0010]). The reactive groups generated (such as the COOH group) are first brought in contact with an alkaline solution such as calcium carbonate solution. See [0054] and [0058]. Calcium carbonate is a metal oxide (as evidenced by Kawahara et al, col.7, lines 35-37) as well as a ceramic (as evidenced by Furuzono et al, col.10, lines 39-41). Also, calcium (Ca^{2+}) as in calcium carbonate is *an oxidized metal* (as evidenced by Norris, claim 4). Thus, Nakagawa's calcium carbonate teaches present reactants, and the moiety of $-\text{COOCa}$ (which is formed by bringing the reactive group $-\text{COOH}$ with CaCO_3) teaches present chemical functionality as well as present chemical functionality comprising at least one oxygen atom having a lone pair of electrons. After that, ions (such as silver, gold, nickel, copper, platinum and palladium) of a conductive material substitute the alkali metal ions, such as Ca^{2+} (see [0065]-[0068]). Finally, the ions of the conductive material are *subsequently reduced so that the conductive material deposits on the surface of the resin* (see [0076]). Thus, Nakagawa also teaches the additional step of reacting the initially formed chemical functionality ($-\text{COOCa}$) with an oxidized metal (such as ions of silver, gold, nickel, copper, platinum and palladium) and then reducing the resulting coordinated metal as described in present claims 6, 8 and 9. Thus, Nakagawa teaches present inventions of claims 1, 2, 4, 6-10 and 14.

Allowable Subject Matter

7. Claims 3, 5, 11, 13, 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Nakagawa does not teach or suggest the use of present visible light of claim 3, present one or more reactants of claim 5, present one or more reactants of claim 11, present additional step of binding one or more whole, respiring cells to the chemical functionality formed in claim 1, as claimed in present claim 13, present polysulfone substrate of claim 15 or present poly(methyl methacrylate) substrate of claim 16.

8. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure. Matsuda et al (5,593,814) teaches a device for controlling cell arrangement having a pattern composed of a cell adhesive surface and a cell non-adhesive surface, which has a good selectivity of cell adhesion and which can provide a fine pattern of cells in high resolution by culturing cells in a usual manner. The device is prepared by a process which comprises placing a mask having a desired pattern on the cell non-adhesive surface of the substrate, and irradiating UV rays or radiation (in the air) to the cell non-adhesive surface through the mask, thereby producing a cell adhesive functional group (such as carboxyl group) only in the exposed portion of the cell non-adhesive surface to patternwise form a cell adhesive surface in the cell non-adhesive surface. The reference does not teach or suggest present one or more reactants as required in present claim 1.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333.

The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/
Primary Examiner, Art Unit 1795
July 2, 2011